

## REMARKS

### EXAMINER REJECTION #3, 4, and 5 – 35 U.S.C. §112

The Examiner rejected Claim 10 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Applicant has amended Claim 10 to recite a proper Markush format per the Examiner's explanation. Thus, the Applicant respectfully requests that the Examiner withdraw the 35 U.S.C. § 112 rejection for the aforesaid reasons.

### EXAMINER REJECTION #6, 7 – 35 U.S.C. §102(b)

The Examiner rejected Claims 1-10, 21-22, and 42 under 35 U.S.C. §102 (b) as being anticipated by Iwamoto et al.

The Applicant respectfully disagrees with the Examiner's finding. In order for the claims of a prior art reference to anticipate a claim, the reference must teach every element of the claim. Iwamoto recites that its invention has 90-10% by weight of an inorganic oxide, and that such inorganic oxides include water containing oxides, alumina, and silica-alumina (see column 6, lines 4-7). However, amended claim includes a recitation of 5 to 95% weight percent of a binder. Iwamoto does not teach the inclusion of a binder in such a recited percentage range. Thus, Iwamoto does not teach each and every element of Claim 1 and its dependent claims. Iwamoto also recites for its process that "it is required that an iron salt is added to steam treated aluminosilicate to which mineral acid has been added, and in other words, the iron salt is added in the presence of the mineral acid" (see column 4, lines 65-70). However, the Applicant's invention recites "conditions effective for substituting aluminum in the aluminosilicate zeolitic material with metal from the soluble metal compound" in Claim 22. The Applicant recites that metal compounds useful for isomorphic substitution reactions preferably are soluble metal fluorides such as iron trifluoride (see specification, page 7, lines 6-9). Iwamoto does not teach such conditions useful for isomorphic substitution of a portion of aluminum from a zeolitic starting material by another metal. As for the Examiner's statement that the "initial silica to alumina ratio increases following the treatment with the mineral acid and iron salt, which means that iron is substituted for alumina which has been removed from the framework," the Applicant notes the following

inconsistency with that statement. The Examples 1 and 2 have a 3.5 weight percent of aqueous nitric acid, and have a silica to alumina ratio of 22.3 and 25.3, respectively. However, Example 3 has a 3.0 weight percent of aqueous nitric acid, but the silica to alumina ratio drops to 18.2, which is contrary to the Examiner's statement. Thus, the Applicant respectfully requests that the Examiner withdraw the 35 U.S.C. § 102(b) rejection for the aforesaid reasons.

EXAMINER REJECTION #8 – 35 U.S.C. §102(b)

The Examiner rejected Claims 1, 3, 5-6, 9-12, 14, 16-18, and 20-21 under 35 U.S.C. §102 (b) as being anticipated by Suzuki et al.

The Applicant respectfully disagrees with the Examiner's finding. In order for the claims of a prior art reference to anticipate a claim, the reference must teach every element of the claim. The Examiner states that aluminogallosilicates having a ratio of 2-4 correspond to a Ga/Al ratio of 0.25-0.5. The Applicant is not sure how the Examiner arrived at such a corresponding ratio computation. The Applicant notes Table 4 and the aluminogallosilicates recited therein. A computation of the Ga/Al ratio of the 17 samples provides a Ga/Al range of 0.036 to 2.78. By contrast, the Applicant recites a ratio of between 1:10 at its lower end, and 2.5:1 at the higher end of the metal to Al ratio in its amended Claim 1. Suzuki does not teach the inclusion of a binder in such a recited percentage range. The Examiner also states that Suzuki recites aluminogallosilicates that may be formed into various shapes using alumina or silica binders, but there is no mention of any percent ranges of the binder as recited in the Applicant's invention. Also, the Examiner recites that Suzuki's composition may include an active metal such as palladium or platinum in an amount in the range of 0.1 to 10% by weight. By contrast, the Applicant claims between 0.05 and 2 weight percent of a noble metal, and Suzuki does not teach a noble metal in such a recited percentage range. Regarding the process recitation of Claim 5, the Applicant has provided reasons above to differentiate the aluminosilicate composition. Thus, the Applicant respectfully requests that the Examiner withdraw the 35 U.S.C. § 102(b) rejection for the aforesaid reasons.

EXAMINER REJECTION #9 – 35 U.S.C. §102(b)

The Examiner rejected Claims 1-8, 11, 13, 16-18, 21-23, 25, 26, and 39 under 35 U.S.C. §102 (b) as being anticipated by Skeels et al.

No binder -

The Applicant respectfully disagrees with the Examiner's finding. In order for the claims of a prior art reference to anticipate a claim, the reference must teach every element of the claim. Skeels discloses zeolite compositions which are topologically related to prior known zeolites but which are characterized as containing framework atoms of iron and/or titanium. By contrast, the Applicant's invention recites a zeolite material incorporation Al and one or more metals selected from the group consisting of Fe, Ga, Ti, Co, and mixtures thereof. Skeels does not teach metals such as Ga, Co, or mixtures of Fe, Ga, Ti, and Co. In addition, Skeels does not teach a zeolite incorporating a binder as recited in amended Claim 1. In addition, Skeels does not teach a refluxing step as recited in claim 22 of the Applicant's invention. Thus, the Applicant respectfully requests that the Examiner withdraw the 35 U.S.C. § 102(b) rejection for the aforesaid reasons.

examples  
much  
refluxing  
step.

EXAMINER REJECTION #10-11 – 35 U.S.C. §103

The Examiner rejected Claims 19, 43, and 44 under 35 U.S.C. §103(a) as being unpatentable over Skeels et al.

The Applicant respectfully disagrees with the Examiner's finding. To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ 2d 1438 (Fed. Cir. 1991).

The catalysts taught by the Applicant's invention are characterized by the presence of one or more additional metals in addition to those typically found in an aluminosilicate zeolitic lattice structure. Unlike the Fe-MFI catalysts in which virtually all of the aluminum in the lattice has been replaced by iron, the catalysts of the Applicant's invention contain significant amounts of both aluminum and one or more metals, including Fe, Ga, and/or Co. Furthermore, Skeels teaches catalysts including Group VIII noble metals alone, or in conjunction with Group IV-B metals in amounts between about 3 and about 15 weight percent of the overall catalyst composition. By contrast, amended Claim 44 recites a percent

range of the noble metal as 0.1 to 2 weight percent. It would not have been obvious to a person of ordinary skill in the art to substitute iron in place of titanium in the ZSM-5 composition taught by Skeels. The Applicant respectfully requests that the Examiner withdraw the rejection of Claims 1-2, 5-8 under 35 U.S.C. §103(a).

#### EXAMINER REJECTION #12 – 35 U.S.C. §103

The Examiner rejected Claims 9-10, 12, 14, and 20 under 35 U.S.C. §103(a) as being unpatentable over Skeels et al. and further in view of Farnos et al. or Absil et al.

The Applicant has cancelled Claims 9, 12, and 20, so all of the rejections pertaining thereto shall no longer exist. The Applicant has amended Claims 10 and 14 to now depend on Claim 1. The amendment of Claims 10 and 14 shall be addressed by the Examiner for patentability.

#### EXAMINER REJECTION #13 – 35 U.S.C. §103

The Examiner rejected Claims 15 and 40 under 35 U.S.C. §103(a) as being unpatentable over Skeels et al. and further in view of Farnos et al. or Absil et al. and Murray et al.

The Applicant respectfully disagrees with the Examiner's finding. Murray merely recites a list of conventional alumina-containing binders known in the art, including boehmite. However, Murray in combination with Farnos and Absil does not teach nor suggest the recitation in Claim 15 of 0.1 to 2.0 weight percent of a noble metal deposited on the binder. The Applicant respectfully requests that the Examiner withdraw the rejection of Claims 15 and 40 under 35 U.S.C. §103(a).

#### COMMENTS REGARDING ALLOWABLE SUBJECT MATTER

The Applicant has followed the Examiner's suggestion regarding Claim 24 and Claim 27. The Applicant has cancelled these claims and introduced new Claims 45 and 46, which have rewritten Claims 24 and 27, respectively, into independent form including all the limitations of their respective base claims and intervening claims.

The Applicant respectfully requests that the Examiner consider the foregoing arguments and amendments. Applicant submits that the subject

claims are now in condition for allowance and respectfully request allowance of these claims

Correspondence Address:  
BP America Inc.  
Docket Clerk, BP Legal, M.C. 5East  
4101 Winfield Road  
Warrenville, Illinois 60555

Respectfully submitted,



---

Nirav Patel  
Attorney for the Applicants  
Registration Number 46,981  
(630) 821-2439

**Marked up version of amended claims**

1. (amended) A catalyst for methylating a naphthalenic feedstock, said catalyst comprising: a zeolitic material incorporating Al and one or more additional metals selected from the group consisting of Fe, Ga, Ti, and Co, and mixtures thereof, wherein the ratio of additional metal(s) is between about 1:10 and [3:1] 2.5:1, and between 5 and 95 weight percent of a binder.

10. (amended) The catalyst of Claim [9] 1 wherein the binder is selected from the group consisting of [binders comprising] boehmite, alkali earth metals and SiO<sub>2</sub>.

14. (amended) The catalyst of Claim [12] 1 wherein the weight percent of the noble metal is between 0.05 and 2.0 weight percent.

44. (amended) The catalyst of Claim 43 further including between [0.1 and 5] 0.1 and 2 weight percent of a noble metal selected from the group consisting of platinum, palladium or mixtures thereof deposited on the catalyst.